

REMARKS/ARGUMENTS

Claims 1-2, 8-10, and 13-31 are pending in this application and are subject to a restriction requirement. Applicant elected the invention defined by Claims 1-10 and rejoined Claims 11-14 for prosecution, with traverse. Claims 1 and 10 are currently amended. Claims 26-31 are new. Claims 15-25 have been withdrawn from further consideration by the Examiner as directed to a nonelected invention. Claims 3-7 and 11-12 have been cancelled.

Support for the amendments to Claim 1 are found in the Specification at page 6, lines 17-25, page 7, lines 19-28, page 9, lines 23-29, and page 10, lines 18-25. Support for the amendment to Claim 10 and new Claims 28 and 31 is found in the Specification at page 5, lines 20-26; page 7, lines 4-5; page 10, lines 18-25, page 12, lines 30-31; and Figure 3. Support for new Claims 26-27 and 29-30 are found in the Specification at page 6, lines 26-30; page 12, line 26, to page 13, line 4; page 13, line 19, to page 15, line 2; page 20, lines 19-30; and in Figures 2, 4, 5, and 6.

No new matter has been added.

Objection to the drawings under 37 CFR § 1.83(a)

The Examiner objects to the drawings under 37 CFR § 1.83(a) because the Examiner finds that “the hexagonal [mesh] and the square mesh” of previously presented Claims 6 and 7 are not shown in the drawings (Office Action (OA), pages 3-4, dated July 2, 2008). Claims 6 and 7 have been cancelled. No other claims explicitly recite either feature. Accordingly, the Examiner’s objection to the drawings should be withdrawn.

Rejection under 35 U.S.C. § 112, 2nd para.

Claims 1-14 have been rejected under 35 U.S.C. § 112, 2nd para., because the phrase "blocking elements allowing to block beads in interstices between said blocking elements in an ordered way and in stacks" is said to be vague and indefinite (OA, p. 4).

While the Examiner has not fully explained why the phrase is vague and indefinite, we surmise that the Examiner considered the language in previously presented Claim 1 vague and indefinite because it did not identify the particular feature[s] which render the claimed micro-system capable of stacking at least two layers of beads (OA, p. 4, last para.).

Accordingly, the phrase "said blocking elements allowing to block beads . . . in stacks" has been deleted from Claim 1 and the phrase "said blocking elements allowing beads of different diameters to be blocked and stacked in interstices between said blocking elements in an ordered way, said interstices constituting said preset locations, wherein said blocking elements are distributed so as to obtain a positioning of the beads as a function of their diameters and said blocking elements are distributed so as to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter" has been substituted therefore.

Claims 10, 28, and 31 further require the blocking elements to be a height that allows at least two second diameter beads to be stacked in the interstice spaces between the wells formed by the blocking elements.

When the claim language is read as a whole and interpreted in a manner consistent with the supporting Specification, persons having ordinary skill in the art would have understood that the beads are blocked and stacked in an ordered way as a function of the distribution and dimensions of the blocking elements relative to the diameters of the beads and the distribution and dimensions of the blocking elements relative to the distribution and dimensions of the wells intended to receive beads of a first preset diameter and the spaces between the wells intended to receive beads of a second preset diameter. Considered in that

light, the claim language is not vague and indefinite. Persons having ordinary skill in the art would have sufficiently understood the scope of the invention defined by Applicant's claims to enable them to compare the claimed subject matter to all Yu discloses.

The Examiner understood the claimed invention and compared it to the prior art. Accordingly, the Examiner's rejection under 35 U.S.C. § 112, 2nd para., should be withdrawn.

Rejection under 35 U.S.C. § 102 over Yu

Pending Claims 1-2, 8, 10, and 13-14 stand rejected under 35 U.S.C. § 102 over Yu (Yu et al., U.S. 2003/0091475, published May 15, 2003). The Examiner reasonably should withdraw the rejection. Yu does not describe all the features of the currently claimed invention.

The Examiner finds that Yu describes a bead trapping device including a tank with a cavity, blocking elements, and inlets and outlets (OA, p. 5, ¶6). The Examiner finds that Yu's Figure 16 "shows T-shaped posts arranged such as to form gaps of different sizes which can provide bead distribution as a function of bead diameter" (OA, p. 5, ¶6). The Examiner also finds that Yu's Figures 14A-B and 15 show blocking elements of various shapes and stacked beads (OA, p. 5, ¶6). We also note Yu's Figure 3 for different blocking element shapes. Finally, the Examiner finds that Yu describes different bead and cavity sizes between 0.5 and 200 μm in diameter (OA, p. 6, first full para.). However, the totality of the Examiner's findings with respect to Yu's disclosure do not describe all the features and/or elements of the invention Applicant currently claims.

The Examiner's findings with respect to Yu's disclosure do not support the Examiner's finding that Yu anticipates an invention Applicant currently claims. First, Yu does not describe a distribution and/or spatial arrangement of blocking elements relative to cavities formed by the blocking elements which allow a precise positioning of beads of

different diameters at preset locations in the bead trapping device. The fact that the trapped beads may have a diameter ranging from 0.5 to 200 μm does not describe or reasonably suggest precise positioning of beads of different diameters in different interstices, i.e., in the wells and spaces between the wells in an ordered way.

Yu's bead trapping device does not employ blocking elements which can block different diameter beads in the interstices between the blocking elements at preset locations in an ordered way. Yu's blocking elements are not distributed so as to obtain a positioning of the beads as a function of their diameters and to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter. Moreover, Yu does not disclose or reasonably suggest that the traverse two-dimensional cross-section of the blocking elements in the cavity is, or should be, larger than the traverse two-dimensional cross-section of either the wells in the cavity or the spaces between the wells in the cavity as new Claims 26 and 29 require. Most certainly, Yu does not disclose or reasonably suggest that the traverse two-dimensional cross-section of each blocking element in the cavity is larger than the traverse two-dimensional cross-section of each well in the cavity or each space between the wells in the cavity as new Claims 27 and 30 require. The primary reason Yu's disclosure is deficient in describing all the features of Applicant's claimed invention is that Yu does not contemplate separating and trapping beads of two distinct diameters at preset locations in an ordered way. Yu's bead trapping device designed to trap uniformly sized bead.

Consider Yu's express statements. Yu states [0028], "Where the diameter of a cavity between posts is referred to, the diameter is the diameter of the largest spherical bead that could fit in the cavity between the posts." Persons having ordinary skill in the art would have understood Yu's statement to mean that Yu's blocking elements do not block smaller diameter spherical beads in the interstices between the blocking elements at preset locations

in an ordered way. Persons having ordinary skill in the art would have interpreted Yu's statement to mean that Yu's blocking elements are not distributed so as to obtain a precise positioning of the beads as a function of their diameters and are not distributed so as to constitute wells intended to receive beads of a first preset diameter and spaces between the wells intended to receive beads of a second preset diameter.

Yu's "cavities . . . preferably have uniform size" [0005]. See Yu's Claim 2. Yu expressly states [0036 (emphasis added)], "Size and shape uniformity of the beads will be an important factor in the performance of the trapping plate. It is preferred that the beads have a uniform size and be close to spherical." Persons having ordinary skill in the art would not have understood that Yu's beads of uniform size have different diameters or that Yu's bead trapping device is capable of blocking smaller diameter spherical beads in the interstices between the blocking elements at preset locations in an ordered way. Yu's blocking elements may form an irregular pattern and still function as Yu desires [0039]. Irregular patterns of blocking elements cannot reasonably be expected to block smaller diameter spherical beads in the interstices between the blocking elements at preset locations in an ordered way. See Yu's Claim 20.

Finally, Yu states [0040 (emphasis added)]:

One advantage of this bead-trapping design is the way fluid is able to flow freely around the sides of the beads This is enhanced by minimizing the cross-sectional areas of the posts

Needless to say, Yu teaches persons having ordinary skill in the art to minimize the cross-sectional areas of the blocking elements relative to the interstices between the blocking elements. Accordingly, Yu teaches away from blocking elements having traverse two-dimensional cross-sections larger than the traverse two-dimensional cross-sections of either the wells in the cavity or the spaces between the wells in the cavity as new Claims 26-31 require. Glancing at any one of Yu's Figures 1, 2A, 2B, 4, 5, 6A-E, 9, 10, 11A-D, 12, 13,

14A-B, 15, 16, and 17-19, persons having ordinary skill in the art would have understood that Yu intends to minimize the cross-sectional areas of the blocking elements relative to the interstices between the blocking elements and fails to describe any bead trapping device wherein the traverse two-dimensional cross-section of the preset blocking agents in the cavity is larger than the traverse two-dimensional cross-section of the wells or spaces between the wells in the cavity.

Finally, the micro-reactors of Applicant's Claims 13-14 are directed to a combination of the micro-system of Claim 1 and beads having two different diameters fitted between the blocking elements of the micro-system of Claim 1 at preset locations in an ordered way. Yu does not describe or reasonably suggest any micro-reactor of that kind.

Yu does not disclose all the features and/or elements required by Applicant's claims. Nor would Yu have reasonably suggested Applicant's claimed invention to a person having ordinary skill in the art at the time Applicant's application was filed. The Office has not satisfied its initial burden to establish a prima facie case of unpatentability. Accordingly, the Examiner's should pass current Claims 1-2, 8-10, 13-14, and 26-31 to issue.

Rejection under 35 U.S.C. § 103

Previously presented Claims 6 and 9 were rejected under 35 U.S.C. § 103 over Yu in view of Peterson (Peterson et al., U.S. 6,893,879, issued May 17, 2005). Claims 6 has been cancelled. Still pending Claim 9 requires the blocking elements to "have a transverse cross-section in the shape of a hexagon. The Examiner erroneously finds that Yu does not disclose a hexagon shape. Therefore, the Examiner cites Peterson in support of the allegation that a hexagon shape for network forming elements is very common (OA, pp. 6-7, ¶9). However, Peterson's teaching is superfluous for the Examiner's purpose because Yu discloses the hexagon shape. See Yu's Figure 3 for the hexagon shape.

The Examiner argues (OA, p. 7, ¶9):

It would have been within the ordinary skill of the artisan at the time the invention was made to have employed hexagonal posts/mesh in the modified apparatus of Yu, in order to increase the density of the post array, thus achieving higher productivity for the apparatus.

However, considering low density of the posts depicted in Yu's drawings and Yu's explicit intent to minimize the cross-sectional areas of the blocking elements relative to the interstices between the blocking elements, persons having ordinary skill in the art reasonably would not have sought to increase the density of the post array or sought to employ a preset array of posts having shapes and dimensions tending to increase the density of the post array. The preset array of posts having shapes and dimensions recited in Applicant's claims is designed to receive and orderly position beads of different diameters in preset wells and spaces between the posts. Yu is interested in trapping uniformly sized beads.

For the reasons stated herein, the invention clearly defined by Applicant's current claims are patentable and should be passed to issue.

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